

# ***EXECUTIVE SUMMARY***

FOR

## **PUBLIC HEARING**

OF

# **DINESH OC**

**(UMRED AREA, WCL)**

**SEPTEMBER - 2009**

***CENTRAL MINING PLANNING &  
DESIGNE INSTITUTE LTD.***

**REGIONAL INSTITUTE – IV  
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CHAPTER – X**

# SUMMARY AND CONCLUSION

## 1.0 INTRODUCTION :

Umrer coalfield has always been one of the fast developing potential coalfields of Maharashtra. Due to its strategic location close to the industrial region and the occurrence of coal seams at shallow depths the coalfield has attained increased importance in recent times.

The block (Makardhokra-III) under report is virgin property. The nearest mining activity is at Umrer and Makardhokra-II opencast projects to the east of the block. One more opencast mine has been formulated in Makardhokra-I property lying to the east of the block. The mine, projected in the report, also augments Makardhokra-I Extn. Geological block along with property of Makardhokra-III block. Makardhokra-I Extn. block is part of Makardhokra-I block, located on the North-East of Umrer-Butibori railway line, which divided the property of Makardhokra-I block. The Makardhokra-I Extn. block was not considered for mining in the PR formulated for Makardhokra-I OC mine .

### 1.1 Location of the mine

- |      |          |   |             |
|------|----------|---|-------------|
| i.   | Village  | : | Hevti       |
| ii.  | Tehsil   | : | Umrer       |
| iii. | District | : | Nagpur      |
| iv.  | State    | : | Maharashtra |

### Geographical location

- |      |               |   |                           |
|------|---------------|---|---------------------------|
| i.   | Latitude      | : | 20°52'10" to 20°53'00" N  |
| ii.  | Longitude     | : | 79° 11'31" to 79°15'18" E |
| iii. | Topo sheet no | : | 55P /5                    |

## 1.2 SOURCES OF DATA

This report has been formulated using various data from the following sources:

Sl. No.	Type of Data	Sources
1	Mining and economic parameters and other miscellaneous data	PR prepared by CMPDIL and Field data received from Umrer Area, WCL.
2	Environmental data including meteorological data, air quality, dust fall rate, water quality and noise level data.	Environmental-data generated for Makardhokra-II OC of Umrer Area of WCL, Maharashtra.
3	Socio-economic study & Land use/cover mapping buffer zone.	Census data 2001 & base line Socio - Economic survey for Makardhokra-II OC.
4	Flora and fauna	Survey Report prepared by the competent authority in this field.
5	Surface hydrology and hydrogeology	CMPDIL, RI- IV, Nagpur.
6	Meteorological data	Environmental-data generated for Makardhokra-II OC of Umrer Area of WCL, Maharashtra.
7	Land use/cover mapping core zone.	As per State Govt. Record, data supplied by the concerned WCL area office.

## 2.0 PROJECT PROFILE :

### 2.1 MINING DETAILS :-

S. N.	Particulars	Total
1.	Area of the Quarry	
a)	On floor (ha)	510.55
b)	On surface (ha)	674.05
2.	Depth (m)	
a)	Initial	45
b)	Final	200
3.	Gradient of Seams	1 in 7 to 1 in 8
4.	Average thickness of seams (m)	
a	Seam – I	3
b	Seam –II (T)	3
c	Seam – III	2
d	Seam –IV	3
e	Seam – V	3
5.	Average Strike length (m)	5365
6.	Width on surface (m) [dip rise]	1225
7.	Width on floor (m) [dip rise]	925
8.	Weighted Grade (0.05m dilution at each contact point)	D (4305)
a	Seam – I	D (4450)
b	Seam –II (T)	D (4420)
c	Seam – III	D (4460)
d	Seam –IV	E (4050)
e	Seam – V	E (4140)
9.	Mineable Reserves (Mt)	82.76
10.	Total OB (including access trench)	660.32
11.	Average stripping ratio (m <sup>3</sup> /t)	7.98

### 2.2 Mineable Reserve

The proposed quarry has been divided in various sectors namely sector A, sector B, sector C, sector D, sector E, sector F, sector G, sector H, sector I, sector J and sector K (shown in Final stage quarry layout plan) for the purpose of scheduling of quarry operations. The sectors have been decided based on dipside FRL in particular sector/various faults encountered in the property. The coal, OB including parting and SR in different sectors are given in table below:

## Sectorwise reserves

Sector	Coal(Mt)	OB(Mm3)	SR(m3/t)
A	3.80	35.73	9.39
B	8.23	78.35	9.52
C	9.82	91.98	9.37
D	4.53	46.11	10.17
E	12.15	91.63	7.54
F	4.45	50.95	11.44
G	17.03	147.63	8.67
H	6.02	28.07	4.66
I	6.60	41.63	6.31
J	5.39	28.61	5.30
K	4.72	19.63	4.16
Total	82.76	660.32	7.98

**2.3 Mine lease area : 1636.97 ha**

Break up is given below .

Sl.No.	Particulars	Total Land (ha)
1	Tenancy land	1428.52
2.	Government land	160.03
3.	Zudpi Jungle	48.42
	<b>TOTAL</b>	<b>1636.97</b>

### 2.4 Shifting of Hevti village –

Hevti Village is proposed to be re-located at new site on mutual agreement and consent of the concerned Gram Panchayat, WCL and State Govt. Authorities as per Company's R&R policy.

### 2.5 Diversion of Road, Nala & Canal:

#### a. Diversion of Nala & Canal –

- i) Diversion of Amb nala - 2.50 km
- ii) Diversion of Irrigation canal - 6.00 km

Diversion will be done through design of Central Design Organisation (CDO), Nasik , Govt. of Maharashtra & approval from Maharashtra State Irrigation Deptt.

**b. Diversion of Road -**

About 4.00 km length of road connecting Makardhokra to Umrer village has to be diverted. This will be done with due consent of State Govt.

**3.0 DESCRIPTION OF ENVIRONMENT :**

One season Baseline Data is yet to be generated for this project, the baseline data generated for nearby Makardhokra - II OC mine is given below to get a window on the existing Environmental Scenario of the proposed project. New baseline data generated for this project will be incorporated in final EIA/EMP

**3.1 Social Profile**

For the purpose of understanding the socio-economic profile the studies are undertaken with respect of following themes only for rural area.

- Population composition
- Population growth and migration
- Literacy status and educational facilities
- Health status and medical facilities
- Occupational structure
- Other civic amenities and infrastructure

These studies are undertaken in two categories i.e. Core zone and Buffer zone.

The core zone comprises of actual leasehold area of the project. Buffer zone is the area within 10 km radius around the core zone.

**3.2 Economic Profile**

To evaluate economic profile following parameters have been considered.

- i. Occupational Structure
- ii. Income Structure
- iii. Agricultural production
- iv. Animal husbandry

i. Occupational Structure:

**The details about the occupation of the population of the buffer zone of Makardhokra-II OC for which baseline data has been generated in 2004 is given below :**

50%	-	Main worker
10%	-	Industrial category
10%	-	Agriculture

Balance 30% fall under trade & commerce, marginal workers etc.

ii. Income Structure

With the opening of the coalmine, a number of local people have got employment in the coalmines, which has resulted in their economic upliftment.

By means of developmental activities in the field of various types of business and other trades in the area, a number of people are getting themselves engaged in different secondary and tertiary sectors of employment which came up till date and are still coming up in the area in order to support different types of industries and domestic demands of the market. The income level of the people in these villages has also been increased with the opening of the coalmines in this area in the past.

iii. Agriculture Production

The land is fertile & used currently for growing cash crops like cotton, chillies etc. apart from the usual food crops like rice, wheat, jowar & pulses.

iv. Animal Husbandary

There are cattles like Sheep, Goat, Buffallos, Cows, Oxes etc. in rural areas.

### **3.3 Environmental quality:**

#### **3.1 Ambient Air Quality**

To assess the ambient air quality status, monitoring stations are identified on the basis of meteorology in the upwind and downwind direction as well as to represent the cross sectional scenario of the project site. Based on the production activities the parameters chosen for assessment of air quality are Suspended Particulate Matter (SPM), Respirable Particulate Matter (RPM), Sulphur dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>) and Carbon Monoxide (CO).

Calibrated Respirable Dust sampler (with an average flow of 1.2 - 1.4 m<sup>3</sup>/min.) is used for monitoring of SPM, RPM and a tapping provided in the hopper of the same sampler is utilised for sampling of SO<sub>2</sub> and NO<sub>x</sub> with proper flow controller (1 L/min).

### **3.2 Water Quality**

Water samples are collected and analysed as per procedures outlined in IS-2488/ IS-3025 / AWWA / APHA. Sterilized bottles are used for collection of water sample for bacteriological analysis, stored in icebox and transported to the laboratory for the analysis. Parameters like pH, Temperature, Dissolved Oxygen, Residual Chlorine, Conductivity, Free Ammonia, Total Hardness, Calcium Hardness and Magnesium Hardness are measured in the field while collecting the samples. MPN index of Coliforms are determined in the laboratory as per standard methods.

### **3.3 Noise Levels**

Ambient Noise level measurements in four co-ordinal directions are carried out using sound level meter, with windscreen during daytime as well as night time.

Noise measurements are made at 1.5 m above ground and about 3m from walls, buildings or other sound reflecting sources. The measurements are carried out in such a way that 1 m away from the sources and 1 m away from the edge of the roads. In order to reduce the disturbances from standing waves, the noise levels measured are averaged over + 0.5 m each of at least three positions. The mean values are taken for reporting.

### **3.4 HYDRO-GEOLOGY:**

Coal mining is done by either underground or opencast method. Both these mining methods create dis-equilibrium in environmental scenario of the area and disturb the ground water conditions in particular. In view of this, Environmental Management Plan (EMP) and its clearance are pre-requisites for any kind of mining projects. As a part of EMP, pre – mining hydro-geological scenario / parameters are to be established as datum lines and these parameters are to be monitored periodically during active and post-mining stages to assess the impact on ground water regime / environment due to the mining activity and also to suggest suitable remedial measures to minimize the impact.

Hydro-geological regime of a geomorphic region is mostly controlled by three major aspects namely (i) geology (ii) topography and (iii) climate, besides the ground water and associated phenomena such as the occurrence and movement of water, the direction & velocity of water flow, the rate & magnitude of fluid potential fluctuation, water present in the formations i.e. conduit & storage function of aquifers, the recharge – discharge process, the inter-action/inter-relation of surface and ground water, the type and change of quality of water in space and time etc.

### 3.5 FLORA & FAUNA

Flora & fauna study of the proposed mine is yet to be carried out. The flora and fauna as ascertained from Forest Department existing in the study area of Makardhokra – II OC are as under.

A. Flora	Core Zone	Buffer Zone
1. Agricultural crops	---	Tur ( <i>Cajanus cajan</i> ), Maize ( <i>Zea mays</i> )
2. Commercial crops	---	Arandi & Cotton
3. Plantation	<i>Pongamia pinnata</i> , <i>Zizyphus jujuba</i> , <i>Bambusa arundinaceae</i> , <i>Tamarindus indica</i> , <i>Peltophorum plerocarpum</i> and <i>Ailanthus excelsa</i>	<i>Pongamia pinnata</i> , <i>Zizyphus jujuba</i> , <i>Bambusa arundinaceae</i> , <i>Tamarindus indica</i> , <i>Peltophorum plerocarpum</i> and <i>Ailanthus excelsa</i>
4. Natural vegetation / forest type	---	As mentioned above / A class (Fuel & Fodder Reserves)
5. Grass lands	<i>Erograstis</i> , <i>Apulda</i> , <i>Cyperus</i> , <i>Chrysopogon</i> , <i>Heteropogon</i> and <i>Aristida</i>	<i>Erograstis</i> , <i>Apulda</i> , <i>Cyperus</i> , <i>Chrysopogon</i> , <i>Heteropogon</i> and <i>Aristida</i>
6. Endangered species	Not Applicable	Not Applicable
7. Endemic species	Not Applicable	Not Applicable
8. Others (specify)	Not applicable	Not applicable
<b>B. Fauna</b>		
1. Total listing of faunal elements	Domestic animals	<b>Fauna Name</b>   <b>Schedule as per Wild life (Protection) Act, 1972</b>
		a. Jackal - Schedule-II, Part II, Section 2B b. Indian Grey Mongoose – Schedule- IV, Section 6A c. Indian Mouse- Schedule-V, Section 6 d. Jungle Cat - Schedule- II, Part- II, Section - 2C e. House Rat - Schedule- V , Section - 6 f. Kavvwa - Schedule – V , Section - 1 g. Bhardwaj – Schedule – IV, Section -11
2. Endangered species	Not Applicable	Not Applicable
3. Endemic species	Not Applicable	Not Applicable
4. Migratory species	Not applicable	Not applicable
5. Details of aquatic fauna, if applicable	Not applicable	Marad , Mangur Katla etc.

## 4.0 ANTICIPATED ENVIRONMENTAL IMPACT & MITIGATION MEASURES :

### 4.1 Environmental Impact Assessment :

Identification of impact is an important task in any EIA study. This helps in focusing attention upon relevant environmental parameters and relating them with the activities involved. As far as mining projects are concerned, the following parameters are important in the Environmental Impact Assessment.

#### 1) Socio Economic Impact

The project will have on the whole a positive impact on socio-economic profile of the area due to increase in employment opportunities, trade and business, community development, improved communication link etc.

Maharashtra Government will be benefited through financial revenues in crores of rupees by way of royalty, sales tax etc. from the direct and indirect operations in the mine area. Central exchequer will also be benefited by way of Income tax, central Sales Tax etc.

#### 2) Impact on land use:

The impact on land use pattern in the region can be into two distinct domains, namely within and outside the mining lease area. The requirement of land is as under:

Sl.No.	Particulars	Total Land (ha)
1	Tenancy land	1428.52
2.	Government land	160.03
3.	Zudpi Jungle	48.42
	<b>TOTAL</b>	<b>1636.97</b>

Mining activities will cause change in pre-mining land use pattern.

#### 3) Impact on Environment:

**Air** - Air quality in respect of SPM, RPM, SO<sub>x</sub> & NO<sub>x</sub> within and around the project area may increase their values if proper mitigative measures are not taken care of may cause pulmonary infections like pneumoconiosis, silicosis etc. irritation of eyes, poor visibility etc.

**Water** – Untreated mine water, Workshop & Domestic effluent water could cause pollution to surface & ground water courses with excess of Suspended solids, Oil & Grease, COD , BOD, Dissolved solids, Sulphates, Chlorides, Bacterial contamination leading to serious problems to aquatic life and human health hazard.

Diversion of surface water courses and lowering of ground water table are the likely impacts on surface and ground water courses leading to water scarcity in the area.

**Noise** - The impact of continued exposure of higher noise levels on humans and fauna are as follows:

- Annoyance and irritation
- Mental and Physical fatigue
- Interference in normal activities
- Health hazards resulting from impaired hearing
- In extreme cases cardio-vascular diseases etc.
- Task interference
- Interference with communication i.e. masking
- Hypertension and higher blood cholesterol

#### **4) Impact on flora & fauna:**

Due to removal of OB and transportation of coal air pollution can affect photosynthesis and transpiration in plants. SO<sub>2</sub> can spread Necrosis diseases in plants. Hence, some impact on flora and fauna.

#### **5) Impact on meteorology:**

Various mines are in operation in this area and meteorological data has been collected for last few decades from nearest IMD station and on analysis it is found that general trend of rainfall differences are within normal cyclic pattern and can not be attributed to mining activities in the area.

#### **6) Impact on Hydrogeology:**

Due to low permeability of aquifers, the impact of mining on local water regime will be marginal and the radius of influence will be limited to a small distance.

Generally, changes to hydro-geological regime occur temporarily at different phases of mining activity.

- a. The pre-mining phase represents a system that has evolved over a long period of time which is relatively unchanging set of hydrological and hydro-geochemical constituents existed.
- b. The active mining phase represents a period of continued disruption and dis-equilibrium of total hydro-geological regime.
- c. The reclamation phase represents a period in which the hydrological and hydro-chemical system starts to adjust to the newly created conditions of reclamation.

- d. The post-mining phase represents a period in which the system, to a major extent, has adjusted to the post –mining conditions so that the rate of change in the ground water system is small relative to phases 2 & 3.

## **4.2 Environmental Measures:**

### **a) Socio-economic Measures:**

Hevti village is proposed to be shifted to a new location with mutual consent and house oustees will be rehabilitated as per CIL's R&R policy. Land oustees will also be suitably compensated.

There will be spontaneous economic stimulus in the area with opening of this project. Traders and private enterprises will grow in the area. Besides, the State exchequer will get revenue through levy of royalty, sales tax etc. and Central exchequer will also be benefited by way of central Sales tax, Income tax, Cess's etc.

Educational and medical facilities will also improve in the area.

### **b) Land Restoration:**

The following activities have been proposed for reclamation of land.

1. Backfilling of the excavated area to the extent possible.
2. Leveling of the backfilled area and carpeting with the topsoil.
3. Creation of garland drains in order to arrest the silt load, due to erosion, to enter into natural watercourses during surface run-off.
4. Grass, legumes and different types of plants etc. will be planted on such reclaimed land in order to make it, as far as possible, conducive to agricultural growth.
5. Technical and biological reclamation of external OB dump.

The density of trees is around 2000 – 2500 plants/Ha.

### **c) Air pollution control measures:**

- (i) All long-life haul roads and service roads will be properly constructed and metalled. Unmetalled roads will be kept free of ruts, potholes etc.
- (ii) All haul-roads will be regularly sprayed with water. Water sprinklers will be regularly used in the project.
- (iii) Overloading of vehicles will be avoided.
- (iv) Covering of loaded trucks by tarpauline.

- (v) Regular cleaning of transportation roads.
- (vi) Adequate green belt will be developed all along the coal transportation road on both sides.
- vii) Enclosure of the crusher house where maximum dust is generated. Also installation of dust suppression system in the crusher house (specially above the hopper in such a way that air borne dust is suppressed without adding much water to the coal).
- viii) Minimising the height of coal-fall at transfer points (to reduce dust formation) and, if necessary, installing dust suppression measures.
- ix) Enclosure of the belt conveyor to reduce the generation of dust due to blowing wind.
- x) Creation of a green belt on both sides of belt conveyors and around coal stocks and the CHP building.

**d) Water pollution control measures:**

**i) Industrial Effluent**

The wastewater from workshop and CHP, which normally remain laden with oil and grease, suspended and dissolved solids etc. will be treated in the Effluent Treatment Plant (ETP). Clear water coming out from the treatment plant will be taken into the closed water circuit and recycled for its reuse.

**ii) Mine Water**

Most of the suspended particles will be settled in the sump and the supernatant water will be pumped out. This water will be passed through sedimentation pond on surface, before being discharged in to natural drain.

**iii) Surface Run-off**

Adequate numbers of vegetation will be grown on the top surface and slopes of the dumps in order to arrest the erosion of soil and it also reduces surface run-off, which helps averting siltation of natural watercourses.

**e) Noise pollution control measures:**

Green belt development and other control measures are recommended to keep the noise levels within permissible limits.

To minimize anticipated noise pollution, following control measures are envisaged:

- Routine maintenance of HEMM
- Provision of earplugs, earmuffs as and when required
- Location of colony at a sufficient distance from mine
- Green belt around colony and industrial complex

#### **4.3 Mine closure plan**

The following steps have to be undertaken in relation to Mine Closure Planning:

- Prior to the surface demolition/restoration a surface audit should be undertaken on all surface structures, spoil heaps, lagoons, etc. to assess whether there are any hazardous materials that could cause problems; viz. explosives, chemicals, etc. A list of surface assets should be prepared and made available to potential purchasers, prospective purchasers could be invited and asked to submit sealed bids, this could ensure that the sale of assets give better financial gain.
- In order to identify potential impact, necessary hydro-geological studies into post-mining ground water recharge has to be done. The void of the mine can be proposed as a water resource to be utilized for aqua-culture.
- Work force on roll of WCL may be re-deployed for gainful utilization of employees of WCL.

As a detailed component of the Closure Plan, a Decommissioning Plan is to be developed towards the final stages preferably 5 years prior to tentative closure of the mine. Once established, it may be updated annually.

## 5.0 Environmental Monitoring Programme:

The environmental monitoring programme will be as the table given below:

S · N ·	Items	Parameters	Frequency	No. of Statio ns	Sub missi on
1 ·	Ambient Air Quality Monitoring	SPM, RPM, SO <sub>2</sub> , Nox, CO & Fugitive dust	Every Fortnight as per Environment Protection (Amendment), Rule 2000	4	Quarterly Report are to be submitted to SPCB & MOEF
2 ·	Water Quality Monitoring	1) 4 Parameters viz. p H, Total Suspended Solids (TSS), Chemical Oxygen Demand (COD) & Oil and Grease. 2) 35 Parameters	Every Fortnight  Once in a Year	3	Quarterly Report are to be submitted to SPCB & MOEF
3 ·	Noise Quality Monitoring	Noise Levels	Every Fortnight	2	Quarterly Report are to be submitted to SPCB & MOEF
4 ·	Environment al Statement		Annual		Annually Report is to be submitted to SPCB before 30 <sup>th</sup> September.
5 ·	Ground Water Level Monitoring & Quality	Water Level & Quality Parameters.	Water Level – Quarterly. Water Quality – Yearly.	In Buffer Zone Village s.	Quarterly Report are to be submitted to SPCB & MOEF
6 ·	Compliance Report of EC Conditions.	All conditions both Specific & General	1 <sup>st</sup> June & 1 <sup>st</sup> December	Not Applic able	Half yearly Report are to be submitted to MOEF

## **6.0 Additional Studies:**

### **6.1 PUBLIC CONSULTATION**

To ascertain the concern of local affected and others who have a plausible stake in environmental impacts of the project / activity public consultation will be done at project site or close proximity for local affected persons with the following activities.

- The process in which public would be directly involved or participate and indirect responses would be received through different modes of communications.
- District Magistrate will preside over the Public Hearing process to get public concerns incorporated in the EIA report.
- Videography of proceedings would be done and would be enclosed with the application for Expert Committee.
- The proceedings will be signed by DM/ADM in the same day of hearing.
- The proceedings will be displayed in web site and other Govt. offices.

This EIA/EMP has been prepared for public consultation.

### **6.2 Disaster Management Plan**

The project report has been drawn in conformity with the prevailing statutory provisions as per Mines Act 1952, CMR 1957 applicable for safety in Opencast Mines. However, the following matters related to safety during opencast operations has to be given a special consideration.

The rain water falling within the project area would be diverted from quarry area providing garland drains and shall be collected towards low lying area. Amb Nala is flowing over the property, which has to be diverted. The whole proposed mine area is above the recorded available HFL of Amb river hence, no provision of flood protection embankment has been made. However, surface water would be channelised through proper garland drains.

The bench height and width would be kept as per the Statute. The gradient of haul road should not be steeper than 1 in 16. Adequate care must be taken for proper construction and maintenance of haul road.

The HEMM deployed in the project would be equipped with suitable in-built safety devices like audio-visual alarm, fire extinguishers, etc.

The fencing should be erected round the quarry surface so that entry to unauthorized persons is checked. Hard hat, safety boots, dust respirators, etc. has to be provided for safe working. Necessary fund provision has been made for the same.

### **6.3 SAFETY ASPECTS FOR OUTSOURCING/HIRING OF HEMM**

Special precaution should be taken while deploying workers in the mine. Before employing any laborer to the mine proper vocational training should be imparted and recommendations of VIII Safety Conference should be strictly followed. Terms and conditions shall be fixed by management for deployment of labours by leaser of HEMM as well as machineries.

### **6.4 DUST SUPPRESSION**

For suppression of dust water sprinkler has to be provided. Suppression of mine dust may be done by using suitable bond, for methodology of application DGMS Circular No.8 of 1997 may be referred.

### **6.5 SLOPE STABILITY**

It is suggested that following action may be taken to deal with slope stability problem.

- i) Vulnerable area may be identified and marked on quarry plan.
- ii) Observation of actual alignment of fault, its throw, joints, etc. may be recorded during the process of exploitation.
- iii) Water drainage system may be properly implemented to prevent accumulation of water in cracks. Also dumps shall be leveled to prevent accumulation of water over it. Proper drainage in dumps shall be also provided to prevent erosion of toe of dump.
- iv) Regular monitoring of tension cracks, horizontal and vertical movement of strata in critical area may be done.
- v) Rise side slope to be reinforced if required because it has to stand through out quarry life. No dumps/surface structures to be located within 15m of quarry edge as it will act as surcharge there by destabilizing the slope.
- vi) No undercutting of slopes to be done.
- vii) Proper hydrogeological studies to be done if water table is at level of slope it should be brought down by using submersible pumps to prevent hydrostatic pressure.
- viii) Proper selection of site for dumping to be done before dumping place shall be made free from loose material. Dumping shall not be done at an angle more than angle of repose of material being

dumped .

- ix) After completion of dumping operations dumps to be stabilized by growing vegetation.
- x) Every person deployed by leaser of HEMM must be trained & briefed about aspects related to slope stability.

## **6.6 RISK MANAGEMENT :**

Ninth Conference on Safety in Mines recommended to adopt Risk Management as a tool for development of appropriate health & safety management in Indian Mines.

**The Safety Management System established by a mine must ensure all risk are identified and critical risks are controlled to ensure long term health and safety.**

**A Safety Management System should set the culture, framework and actions necessary to ensure that mining operations are carried out safely.**

## **6.7 Socio-economic Impact**

The socio –economic impacts of the proposed project is given below.

### **A) Population Growth and Migration**

The opening of this project will be having an impact on the people inhabiting surrounding the project area. There will be migration of people from outside due to more job opportunities in the project area. Thus, the population in this area is likely to increase.

### **B) Resettlement & Rehabilitation.**

There is one village named Hevti exists in the core zone. Hence , resettlement of Hevti village has been proposed. In addition, 1636.97 ha of land will be acquired. Rehabilitation of land & house oustees will be done as per Company's norms.

### **C) Transport and Communication**

The provision of metalled approach road to the place of work and other places of public interests like shopping, education, medical services etc. is going to improve the existing transport & communication net work.

D) Health

With the opening of this project, the facilities created in the project are likely to be extended for neighboring population also.

E) Literacy

After coming up of this project, educational facilities developed in the project area will help to improve the literacy of the rural areas also around this project.

## **7.0 Project Benefits:**

The benefits of the project can be summarized as below:-

- The physical infrastructure in the area will be improved substantially by following ways:-

- Development of road, thereby improving the communication.
- Improvement in Power, Telephone (including Mobile) facility.
- Improvement in Health Care facility & Educational facility.
- Improvement in Market / Trade & Business.

- The social infrastructure by way of cultural mixing of people of other states with local community glorifying “UNITY IN DIVERSITY”.

- Substantial employment in the project & indirect employment for business & trading, contractor, transportation, vehicle contractor, nursery development.

## **8.0 Environmental Cost Benefit Analysis:**

No cost benefit analysis has been suggested in the TOR by MOEF.

## **9.0 Environmental Management Plan:**

The implementation and monitoring of pollution control measures and for overall environmental management, environmental cell at the area and corporate level will take all necessary care. It will look after the following aspects of environmental management.

- Generation of environmental data bank
- Evolving micro environmental plan for the project in collaboration with other agencies and consultants
- Monitoring project implementation along with environmental control measures.
- Co-ordinate with other activities to ensure timely implementation of the project.
- Co-ordinate with Ministry of Environment & Forest, Central/State Pollution Control Board for prevention and control of water and air pollution.

## 9.1 ENVIRONMENTAL COST PROJECTION

### a) Capital Requirement for Environmental Protection Measures :

SL. NO.	PARTICULARS	TOTAL AMOUNT ( IN Rs. LAKHS)
1	SEDIMENTATION POND FOR MINE DISCHARGE	15.0
2	EFFLUENT TREATMENT PLANT FOR WORKSHOP	10.0
3	BASELINE DATA GENERATION	5.0
4	FIXED TYPE WATER SPRINKLER	8.0
5	PLANTATION DURING FIRST THREE YEARS	15.0
6	THEMATIC MAPPING FOR LAND USE THROUGH REMOTE SENSING	8.0
	<b>TOTAL</b>	<b>61.0</b>

b) In addition Rs. 3.0/t (every year ) of coal under revenue head has been kept to cater for—

- i. Plantation
- ii. Env. Monitoring / auditing
- iii. Social Development
- iv. Misc. pollution control measures.
- v. Compliance for statutory obligations like Consent fee , Water Cess payment etc.
- vi. Compliance for statutory obligations like Consent fees, Water Cess payment , Authorization etc.

It is felt that the above provisions are adequate to handle the existing pollution load. However, if need arises, necessary action along with provision of fund shall be accordingly taken.

**Note: - Rs. 3/te of coal production has been kept under revenue head for Environmental Protection Measures which comes to Rs. 90 lakhs per year. 10% of this amount i.e. Rs. 9 lakhs per year would be spent towards CSR.**